

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in view of the following remarks, is respectfully requested.

Claims 27 and 31 are pending. Claims 28-30 and 32-34 are canceled, and Claims 27 and 31 are amended. No new matter is added.

In the outstanding Office Action, Claims 27-34 were rejected under 35 U.S.C. § 112, first paragraph; and Claims 27-34 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. 2004/0002364 (Trikkonen) in view of U.S. 2003/0125040 (Walton).

A telephone interview was conducted with Examiner Patel on August 22, 2011, to discuss the outstanding rejections. Applicant thanks the examiner for his time and comments at the interview.

At the interview, amendments to the claims consistent with those presented herewith were discussed. Further, the rejections under § 112 and § 103 were discussed. In summary, the examiner indicated that, in light of the arguments presented below, the rejection under § 112 appeared to be overcome and the rejection under § 103 would be reconsidered. Appropriate action is thus respectfully requested.

Concerning the rejection under § 112, first paragraph, the Office Action at page 3 states “N being an integer of 2 or larger,” “weight-related information” and “the weight-related information is common to the plurality of frequencies,” is not described in the specification. Applicant respectfully disagrees.

‘N’ as defined in Claim 27 refers to a number of antennas, first introduced in Fig. 1 and paragraph [0014], and referred to throughout the application. This issue was discussed at the interview, and it was agreed to remove the rejected language from Claim 27 because it was redundant.

Concerning “weight-related information,” this feature is in Claim 27 as included in the received control information (by a control signal), and includes a set of the first N-dimensional weight vector and the second N-dimensional weight vector. In Fig. 26, at S703 Terminal B determines a transmission beams to be used, using an estimated propagation vector, and at S704 Terminal B notifies Terminal A of a transmission beam to be used by way of a control signal. See paragraph [0098]. It should be appreciated here that the transmission beam, which as presented in paragraph [0095], is made by an information signal that is multiplied by the weight vector to effectively create signals separately transmitted by the plurality of antennas to form the beam. That is, the control signal sent from the Terminal B to the Terminal A includes the weight-related information (beam selection).

Concerning the “the weight-related information is common to the plurality of frequencies,” phrase, paragraph [0093] states the control signal is common to all the sub-carriers so that the control amount can be greatly reduced (in comparison to previously discussed embodiments in which a control signal is required for each sub-carrier).

In light of the above, it is respectfully submitted the claimed features fully comply with the written description requirement. Should the examiner disagree, the examiner should contact the undersigned to resolve this issue.

As previously presented, Claim 27 defined a configuration which provides an effect not provided in the art of record. That is, the claimed weight-related information included in the claimed control information (which includes a set of first and second N-dimensional weight vectors) can be used for a plurality of different frequencies. Therefore, the transmission weights of the plurality of frequencies can be controlled with a smaller amount of control information (relative to a case where control information is transmitted for each frequency).

As currently amended to incorporate Claim 29, Claim 27 recites the first information signal and the second information signal include one of a set of signals modulated by different modulation schemes and a set of signals encoded by different encoding methods, and the weight-related information is common to all of the plurality of frequencies used for signal transmission from the radio communication system to the system of the communication partner. The cited references fail to disclose or reasonably suggest these features.

Trikkonen describes a configuration in which a transmission beam is selected in a MIMO channel, but does not give any description regarding control of handling a plurality of different frequencies. Turning to the claim language, there is no description in Trikkonen as to ***weight-related information*** which is ***common*** to the plurality of frequencies and used as the control information. The Office Action acknowledges this deficiency at page 6, and relies on Walton to cure the deficiency.

Walton describes embodiments in which a CSI (channel state information) is fed back so as to perform transmission control in a MIMO channel, but does not describe a configuration in which weight-related information including N-dimensional weight vectors representing a plurality of transmission weights is notified. At paragraph [0312], Walton describes eigenmodes which may be construed as including information associated with transmission weight. However, with the eigenmodes, the transmission weight is changed depending on a channel state ***of each frequency, resulting in different transmission weights among the frequencies***. There is no teaching in Walton concerning weight-related information which is common to all of the plurality of frequencies used for signal transmission from the radio communication system to the system of the communication partner.

The Office Action at page 7 states Walton describes a common coding and modulation scheme may be used for all transmission channels selected for data transmission, referring to Figs. 3B, 3D, [0105], [0126] and [0187]. That is, Walton describes using a common coding, such as convolutional or Turbo, and a common modulation, such as PSK or QAM. These portions of Walton are silent regarding the use of common transmission weights among the channels. It appears the Office Action relies on coding and modulation as weight factors, but this is technically wrong. A weight is a multiplication factor applied to a signal, whereas coding and modulation relate to different concepts. Moreover, Claim 27 states the first information signal and the second information signal include one of a set of signals modulated by different modulation schemes and a set of signals encoded by different encoding methods. Accordingly, the conceptual distinction between weight factors, coding and modulation is defined in Claim 27.

According to Claim 27, the weight-related information is common to the plurality of frequencies and is used as control information. Therefore, Claim 27 provides an advantage over the cited references in that the use of a transmission weight common to the plurality of frequencies enables a reduction in amount of control information.

As a result, it is respectfully submitted Claim 27 is allowable over Trikkonen and Walton. Although varying in statutory class and scope, it is respectfully submitted Claim 31 is also allowable over the art of record for reasons similar to those noted above regarding Claim 27. Accordingly, it is respectfully submitted the outstanding rejections are overcome by the new claims.

Consequently, it is respectfully submitted no issues remain pending and this application is in condition for allowance. Should the Examiner disagree, the Examiner is encouraged to contact the undersigned to discuss any remaining issues. Otherwise, a timely Notice of Allowance is respectfully requested.

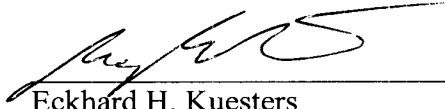
Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, L.L.P

Customer Number

22850

Tel: (703) 413-3000
Fax: (703) 413-2220
(OSMMN 06/04)



Eckhard H. Kuesters
Attorney of Record
Registration No. 28,870

Marc Robinson
Registration No. 59,276